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10/661,515	09/15/2003	Young Kug Lim	8733.869.00-US	7414

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EXAMINER	
KOCH, GEORGE R	
ART UNIT	PAPER NUMBER
1734	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/25/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/661,515	LIM ET AL.	
	Examiner	Art Unit	
	George R. Koch III	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-77* is/are pending in the application.

4a) Of the above claim(s) *1-41 and 75-77* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/11/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. It is noted that on January 11, 2007, the applicant filed an information disclosure statement containing 65 Japanese references and one US patent. Numerous references exceed 50 pages in length, including four which are longer than 100 pages and one those which comes in at a staggering 291 pages. It is loosely estimated, using a generous 40 page per document estimate, that applicant filed 2,500-3,500 pages of material that was listed on the statement, for examiner's benefit in advancing the prosecution of this application.

It should also be noted that this filing is not the applicant's sole filing. On December 16, 2003, applicant also filed a statement with over 150 documents.

It should be noted that examiner is assigned, on average, 17.1 hours per application (including RCE application). These number should be kept in consideration.

2. It is also noted that over 170 foreign reference documents where actually scanned into the file on January 11, 2007. However, only 65 foreign publications are listed on the statement. Thus, it appears that applicant may have left off an additional 105 documents (raising the total page count filed to approximately 6000 pages). Only the documents on the statement have been reviewed.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 55-63 and 71 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 55 recites the limitation "the first and substrates" in line. There is insufficient antecedent basis for this limitation in the claim.

Alternatively, claim 55 could be rejected as being unclear. Applicant has pluralized substrates, and used "first and". It appears applicant inadvertently left out the term --second-- in the claim.

6. Claims 56-63 are similarly rejected since they depend from claim 55

7. Claim 71 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are:

contacting the first and second substrates with a sealant material;

venting the sealed interior space to apply pressure to the first and second substrates contacted by the sealant material, wherein, after venting, the first and second substrates are bonded together; and

unloading the bonded substrates

It is unclear how claim 71 can bond the substrates without these steps. It is further noted that applicant appears to believe that these steps are present - applicant states

that claim 71 includes all of the limitations of previous claim 42, but these steps appear to be inadvertently omitted.[1]

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 42, 44-48, 50, 52, 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Satoshi (Machine translation of the JP 2001-356353 reference submitted in the 12/16/2003 IDS).

Satoshi discloses a method for fabricating a liquid crystal display (LCD) panel using a substrate bonding device (Figure 1) having a base frame (items 2 and 3); a lower chamber unit (item T1) mounted to the base frame, wherein the lower chamber unit includes an upper surface; an upper chamber unit (item S1) arranged over the lower chamber unit, wherein the upper chamber unit is moveable relative to the base frame and wherein the upper chamber unit includes a lower surface, chamber moving means mounted to the base frame for raising and lowering the upper chamber unit; an upper stage fixed to the upper chamber unit for securing a first substrate; a lower stage fixed to the lower chamber unit for securing a second substrate; and sealing means

[1] If applicant responds with the argument that the steps are not required, examiner will review the claims to see if they constitute a new invention (i.e., bonding without sealant). As it is, the remarks seem to suggest that applicant inadvertently omitted essential steps that were intended to be in the claim.

provided to at least one of the upper and lower surfaces for sealing an interior space surrounding the first and second substrates, wherein the sealed interior space is definable joined ones of the upper and lower chamber units, the method comprising, loading the first and second substrates onto the upper and lower stages, respectively; lowering the upper chamber unit to seal the interior space from an external environment via the sealing means (paragraph 0033); evacuating the sealed interior space (paragraph 0034); moving the upper chamber unit and the upper stage, thereby positioning the first substrate to align with the second substrate; contacting the first and second substrates with a sealant material (paragraphs 0036-0037); venting the sealed interior space to apply pressure to the first and second substrates contacted by the sealant material, wherein, after the venting, the first and substrates are bonded together (paragraph 0038, supplying the N2 gas); and unloading the bonded substrates (paragraph 0038 - insertion and removal of the cel).

As to claim 44, Satoshi disclose coating the sealant material and dispensing the liquid crystal material onto the second substrate (see paragraph 0010, see also paragraph 0032).

As to claims 45, 46, and 47, Satoshi discloses that the sealant is heat and UV treated (i.e., that a sealant that thermosets and photosets is used - see paragraph 0038).

As to claims 48 and 50, Satoshi discloses that the substrate can be a TFT array substrate (see paragraph 0002).

As to claim 52, Satoshi discloses using suction and electrostatic charges as claimed (paragraphs 0020-0022).

As to claim 53, Satoshi discloses that the securing includes generating the suction force before the electrostatic charge (see paragraphs 0033-0035).

As to claim 54, since the evacuating takes place over a period of time, Satoshi discloses that the evacuating includes evacuating the sealed interior space to a first pressure and further substantially evacuating the sealed interior space after the sealed interior space has been evacuated to the first pressure.

10. Claims 42, 44, 45, 49-50, 52, 53, 54 and 67 are rejected under 35 U.S.C. 102(b) as being anticipated by Hazishume (US 2002/0062787).

Hazishume discloses a method for fabricating a liquid crystal display (LCD) panel using a substrate bonding device (Figure 19 or 35-36) having a base frame (visible in Figure 19 or 35-36); a lower chamber unit (item 71b, see Figure 10) mounted to the base frame, wherein the lower chamber unit includes an upper surface (including 72b); an upper chamber unit (item 71a, Figure 10) arranged over the lower chamber unit, wherein the upper chamber unit is moveable relative to the base frame and wherein the upper chamber unit includes a lower surface (including item 72a), chamber moving means (item 125, Figure 19) mounted to the base frame for raising and lowering the upper chamber unit; an upper stage (item 72a) fixed to the upper chamber unit for securing a first substrate; a lower stage (item 72b) fixed to the lower chamber unit for securing a second substrate; and sealing means provided to at least one of the upper and lower surfaces for sealing an interior space surrounding the first and second

substrates (item 242 and 241 in Figure 35, or item 259 in Figure 36), wherein the sealed interior space is definable joined ones of the upper and lower chamber units, the method comprising, loading the first and second substrates onto the upper and lower stages (shown in Figure 10 and paragraphs 0119-0125), respectively; lowering the upper chamber unit to seal the interior space from an external environment via the sealing means (shown in Figure 19, also recited in paragraph 0133 - "closes the vacuum chamber 71"); evacuating the sealed interior space (paragraph 0134); moving the upper chamber unit and the upper stage, thereby positioning the first substrate to align with the second substrate (see Figure 17, description of alignment device in paragraphs 0165-0175); contacting the first and second substrates with a sealant material (see paragraph 0081); venting the sealed interior space to apply pressure to the first and second substrates contacted by the sealant material, wherein, after the venting (paragraph 0184), the first and substrates are bonded together (see paragraph 0176-0185); and unloading the bonded substrates (Figure 21 - see paragraphs 0191-0194. The transportation effectively vents as well).

As to claim 44, Hazishume discloses prior to loading, coating sealant and liquid crystal material onto the second substrate (see paragraph 0083, which discloses that the liquid crystal is disposed on the same substrate that has the seal).

As to claim 45, Hazishume recites UV photosetting sealant (paragraph 0017, 0200, which recites that the lamp is a UV lamp).

As to claim 49, Hazishume discloses that the upper substrate is a color filter (paragraph 0079).

As to claims 50, Hazishume discloses that the lower substrate is a TFT (paragraph 0079).

As to claim 52, Hazishume discloses securing the substrates by use of suction and electrostatic charge (see paragraph 0132).

As to claim 53, Hazishume recites generating suction before electrostatic (see paragraph 0132, for example).

As to claim 54, since the evacuating takes place over a period of time, Satoshi discloses that the evacuating includes evacuating the sealed interior space to a first pressure and further substantially evacuating the sealed interior space after the sealed interior space has been evacuated to the first pressure.

As to claim 67, Hazishume discloses directing UV light (see paragraph 0200).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Satoshi as applied to claim 42 above or Hazishume (US 2002/0062787) as applied to claim 42 above, and further in view of Gaynes (6,129,804).

As to claim 43, Satoshi and Hazishume does not disclose applying sealant and liquid crystal material to different substrates. However, both Gaynes discloses utilizing liquid crystal tiles (with the material already applied) and bonding them to a separate substrate (the back or cover plates) that has sealant materials (item 15) previously applied. One in the art would do so in order to facilitate bonding. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized material applied to multiple substrates in order to facilitate bonding.

14. Claims 67-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoshi as applied to claim 42 above or Hazishume (US 2002/0062787) as applied to claim 42 above, and further in view of Gaynes (6,129,804)

Satoshi discloses applying UV light to the material to harden the material, but does not disclose directing the UV light. However, Gaynes discloses that it is known to use multiple light guides to direct the UV light. One in the art would do so in order to prevent overheating or damage to other locations of the substrate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized directing of the UV light in order to prevent overheating or damage.

As to claim 68, neither Satoshi nor Hazishume disclose directing the light to multiple regions

As to claim 68, Gaynes as incorporated discloses that it is known to apply the UV light to multiple regions of the substrate, and discloses 8 regions (see Figure 3, items 66). Furthermore, it would have been obvious to expand the number of UV zones. One in the art would do so in order to handle larger substrates. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized at least 10 regions in order to bond larger substrates.

As to claims 69 and 70, official notice is taken that it is well known and conventional to apply UV light at any point after the coating operation. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized in order to ensure proper sealing.

15. Claims 48- 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoshi as applied to claim 42 above, and further JP09-061829 (from 12/16/2003 IDS) and Hazishume (2002/0062787).

Satoshi does not suggest using a color filter substrate - Satoshi only discloses bonding TFT substrates to each other.

JP09-061829 discloses that the substrates can be a color filter substrate, and that the color filter substrate results in a LCD element that has high display uniformity (see abstract). Additioanlly, Hazishume discloses that TFT substrates are bonded to TFT substrates (paragraph 0079). Furthermore, one in the art would appreciate that

either the first or second substrate could be the color filter substrate, as a matter of design choice. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized color filter substrates in order to achieve a LCD element that has high display uniformity.

Response to Arguments

16. Applicant's arguments filed 10/26/2006 have been fully considered but they are not persuasive.

17. Applicant continues to argue, on page 17 of the remarks that claim 42 is patentable because Satoshi does not recite moving the upper chamber and the upper stage. However, Satoshi does disclose this in paragraph 0015 of the translation. The top chamber 21 has a linear structure which moves up and down, disclosed explicitly by the language of "housing 30 having a linear bush and a vacuum seal, and moves to up and down Z-shaft orientation". The stage itself also moves up and down, and this is disclose explicitly by the language "the electrostatic fixing disc 28 of the top chamber 21 and its interior has structure which can move up and down independently, respectively". It appears applicant believes that these steps must occur synchronously, however, this limitation is not part of the claim. Applicants amendments do not overcome this. Thus, Satoshi anticipates claim 42.

18. Additionally, applicant argues that Hazishume, paragraphs 0165-0175, does not anticipate for the same reason. Examiner disagrees. In paragraph 0166 of the cited section, reference is specifically made to the step of "The first movement mechanism

112 selectively raises and lowers the upper chuck unit 72a" as part of the alignment operation. Attached to this movement mechanism is also an image pickup 111 with a lens 115, 116, which is held above the upper chuck unit 72a. Also, paragraph 0166 makes very clear that "the position of each lens 115, 116 relative to the upper chuck unit 72a does not change." Thus, the image pickup unit and the upper chuck unit are fixed relative to each other.

Next, in paragraph 0167, Hazishume explicitly discloses the step of "horizontally moves the image pickup device 111 such that the axis of the first or second lens 115, 116 corresponds to the axis of the through hole 117". Since the image pickup device is fixed to the upper chuck unit, the upper chuck unit is also being moved. Thus, Hazishume's alignment steps clearly move the upper chuck unit.

The chamber also moves as well - see the figures, which show the upper chamber at raised and lowered postions. See paragraph 0120 which was previously cited with respect to loading and which discloses a movement system for raising and lowering the chamber.

Allowable Subject Matter

19. Claims 55-63 and 71 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action, as stated above.

20. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 55-63, while the prior art of record does suggest holding the first and second substrates apart by a predetermined distance and aligning using rough and fine alignment marks as claimed (for example, 2002/0043344, see Figure 4), the prior art does suggest doing so in the context of the limitations of claim 42.

With regard to claim 71, the prior art of record does not disclose, in the context of the limitations of claim 42, the further limitations of wherein the unloading includes: securing the bonded substrates to the upper stage; raising the upper stage to which the bonded substrates are secured; arranging a loader proximate the bonded substrates, secured to the upper stage; releasing the bonded substrates from the upper stage, wherein the released bonded substrates are supported by the loader; and removing the loader supporting the bonded substrates from the substrate bonding machine.

21. Claims 64-66 and 72-74 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

22. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claim 64-65, the prior art of record (Satoshi - see rejection of claims 52 and 53 above) does disclose applying a suction and electrostatic charge from the upper stage to the first substrate, and aligning the first and second substrate, the

prior art of record does not disclose deactivating the electrostatic charge applied from the upper stage, raising the upper chamber unit to a predetermined height, determining the alignment state of the first and second substrates, and realigning the aligned first and second substrates as determined based upon the determination of the alignment state.

With regard to claim 66, the prior art of record does not disclose, in the context of the limitations of claim 42, the further limitations of providing a plurality of venting holes within the upper and lower stages, and providing low vacuum chamber pipelines to the sealed interior space, wherein the venting includes: in a first venting step, injecting nitrogen gas into the sealed interior space through the plurality of venting holes provided within the upper and lower stages; and in a second step, injecting nitrogen gas through the low vacuum chamber pipelines increase the pressure inside the sealed interior space equal to an atmospheric pressure.

With regard to claim 72, the prior art of record does not disclose, in the context of the limitations of claim 42, the further limitations of wherein the unloading includes: securing the bonded substrates to the upper stage; raising the upper stage to which the bonded substrates are secured; raising a lift pin through the lower stage and over the upper surface, wherein the raised lift pin is proximate the secured bonded substrates; releasing the bonded substrates from the upper stage, wherein the released bonded substrates are supported by the raised lift pin; and arranging a loader proximate the bonded substrates supported by the raised lift pin; lowering the raised lift pin such that

the bonded substrates are supported by the loader; and removing the loader supporting the bonded substrates from the substrate bonding machine.

With regard to claims 73-74, the prior art of record does not disclose, in the context of the limitations of claim 42, the further limitations of wherein the unloading includes: raising the bonded substrates above the upper surface, wherein the raised bonded substrates are supported by a raised lift pin arranged through the lower stage and over the upper surface; arranging a loader proximate the raised bonded substrates supported by the lift pin; lowering the raised lift pin such that the bonded substrates are supported by the loader; and removing the loader supporting the bonded substrates from the substrate bonding machine.

Conclusion

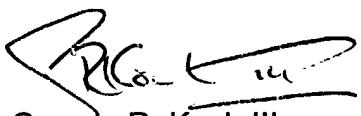
23. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230 (TDD only). If the applicant cannot make a direct TDD-to-TDD call, the applicant can communicate by calling the Federal Relay Service at 1-866-377-8642 and giving the operator the above TDD number. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



George R. Koch III
Primary Examiner
Art Unit 1734

GRK
1/21/2007